ZELL COMPANY L.L.C. CIVIL ENGINEERING
TIBI ADSUMUS

Phone: 623 • 547 • 2500
P.O. Box 2191
Litchfield Park • Arizona
85340

FINAL Basis of Design Report

☑ APPROVED
☐ APPROVED AS NOTED
☐ REVISE AND RESUBMIT

CITY OF SCOTTSDALE
SCOTTSDALE WATER
9379 E San Salvador Dr.
Scottsdale, AZ 85258

Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance.
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY JCampo **DATE** 5/12/2025

ABBREVIATED WATER/SEWER REPORT FOR FLEXJET 15115 N. AIRPORT DRIVE SCOTTSDALE, ARIZONA 85260

PREPARED FOR:

Larson Associates Architects, Inc.
3807 N. 24th Street Suite 100
Phoenix, Arizona 85016

Job Number 21-028
April 23, 2024

at your service

ZELL COMPANY L.L.C.
CIVIL ENGINEERING
Phone: 623 • 547 • 2500
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Litchfield Park • Arizona
85340

WATER & SEWER DESIGN REPORT
FLEXJET
15115 N. AIRPORT DRIVE
SCOTTSDALE, ARIZONA

In accordance with Arizona Administrative Code Title 18 Chapter 9-E301, the following is the water & sewer design report for the Flexjet project located at 15115 N. Airport Drive in the Scottsdale Airpark. This project has demolished the current building located on the parcel and will construct a new building with an underground parking structure. The new building will house a new aircraft hangar with storage area, and a private jet terminal.

The parcel is approximately 0.92-acres in size and is part of the Scottsdale Airpark and is owned by the City of Scottsdale. The owner is leasing the parcel from the city.

The previous two existing buildings have been demolished. The existing water, sewer, fire hydrant, and fire taps serving the parcel will be removed and reused as practical.

Based on the areas of the building and the construction types, the required fireflow demand is 6,250 gpm. See table below:

Building Use	Area (SF)	Construction Type	Required Fire Flow (gpm)	Duration (hr)
Underground Garage	33,451	V-B	5,000	4
Storage Area	4,370	V-B	1,750	2
Terminal	18,627	V-B	3,750	3
Hangar	29,919	I	1,750	2
Total	86,367	-	7,250	4

Based on a 75% reduction for a fully sprinklered building, the required fire hydrant flow is 1,812 gpm. Two exiting fire hydrants along Airport Drive will be used to meet this demand.

A flow test was performed in July 2021 on the existing onsite fire hydrant. This hydrant is fed from the 12" water line in Airport Drive. Based on the results of the test, the hydrant flowed 2,693 gpm with a residual pressure of 80 psi. Extrapolating the data, the 12" water line is capable of providing 7,086 gpm at 20 psi residual pressure in the system. This is more than adequate to meet the fire demands for the project.

Based on the City of Scottsdale Water Demand Table, inside and outside water use for an office use is based on 0.6 gallons per day (gpd) per square foot of building area. To account for the hangar operations, we added another 0.1 gpd/sf to the water estimate. The terminal portion of the Flexjet building is 18,627 SF in size. The hangar portion of the building is 29,919 SF in size. The average daily demand for the project is 14,168 gpd. Average daily water use was converted to gallons per minute based on a 16-hour day. The maximum daily demand was estimated as 1.7 times the average daily demand. The peak hourly flows were estimated as 1.7 times the maximum daily demand. The following chart summarizes the water demands for the project:

Use	Area (SF)	Average Daily Usage (gpd)	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hourly Demand (gpm)
Terminal	18,627	11,176	11.64	19.79	33.64
Hangar	29,919	2,992	3.12	5.30	9.01
Total		14,168	14.76	25.09	46.65

The water and fire demand for the project will be supplied from the existing 12" ACP water line in Airport Drive. The fire flow demand and maximum daily demand is 1,837 gpm. Based on the flow test performed, both demands can be met by the 12" water line.

The wastewater generated by the project will be conveyed to an existing 8" sewer line in Airport Drive. One new 6" sewer tap is anticipated for the new building. Final details will be worked out as the project continues to develop.

Based on the City of Scottsdale Wastewater Demand Table, the average daily sewer demand for an office use is based on 0.4 gallons per day (gpd) per square foot of building area. We have estimated the hangar use will generate 0.2 gallons per day (gpd) per square foot of area. The peaking factor is 3.0. Based on this, the anticipated wastewater demands for the project are as follows:

Use	Area (SF)	Average Daily Usage (gpd)	Average Day Demand (gpm)	Peak Hourly Demand (gpm)
Terminal	18,627	7,450	7.76	23.28
Hangar	29,919	5,984	6.23	18.69
Total		13,434	13.99	41.97

See Appendix for supporting material.

APPENDIX


E Karen Dr
N 75th St
N 75th St
N Airport Dr
N Airport Dr
N 75th St
N 75th St
E Butherus Dr
E Butherus Dr
N Aviation Way
N Airport Dr
N Airport Dr
215-56-067B
215-56-064A
215-56-064A
215-56-062C
215-56-061A
215-56-061B
215-56-001S
215-56-001S
215-56-001P
215-56-001P
215-56-001M
215-56-039
SCOTTSDALE AIRPARK NO. 3
SCOTTSDALE AIRPORT MLO

IgCC CHECK COMPLIANCE

1. HEAT ISLAND MITIGATION: OVER 50% OF THE HARDSCAPE ACCOMMODATED BY OPTION (E) PARKING UNDER A BUILDING, IN ACCORDANCE WITH 2021 IgCC SECTION 5013.5.1 (BELOW GRADE PARKING GARAGE)

2. ELECTRIC VEHICLE CHARGING: UNDERGROUND PARKING GARAGE WILL ACCOMMODATE 4% OF TOTAL REQUIRED PARKING SPACES OR NOT LESS THEN 8% OF DESIGNATED EMPLOYEE ONLY PARKING SPACES OR 10% OF REQUIRED TOTAL PARKING SPACES

3. ENERGY COMPLIANCE PATH: PRESCRIPTIVE BASED COMPLIANCE - COMPLY WITH MANDATORY AND PRESCRIPTIVE REQUIREMENTS IN 2021 IECC OR ASHRAE 90.1-2019

4. ONSITE RENEWABLE ENERGY SYSTEM (SOLAR PV) - NOT LESS THEN 3% OF ANNUAL ESTIMATED ENERGY OR 2 WATTS PER SQ. FT. MULTIPLIED BY THE GROSS ROOF AREA IN ACCORDANCE WITH IgCc AMENDED SECTION 1013 - SOLAR PANELS WILL BE ROOF MOUNTED SEE KEYNOTE 50/SP1.1

5. REFUSE AND RECYCLING COLLECTION - LOCATION NOTED PER KEYNOTE 49/SP1.1

LEASED PARKING
36 SPACES

EXISTING BUILDING
ZONING PAD-14

N. AIRPORT DRIVE

20'-0" LANDSCAPE SETBACK

ramp down to parking garage

174 SF

436 SF

vehicle access to ramp

LEASEHOLD BOUNDARY

Phenom 300

Gulfstream G650

Challenger 300

Praetor 500

HANGAR OVER BELOW-GRADE PARKING STRUCTURE
AIRPORT PROPERTY
ZONING I-1
215-56-413E

EXISTING HANGAR

PASSENGER TERMINAL/ OFFICE BUILDING 2-STORY

SITE LEGEND

- ASPHALT PAVING
- VEHICULAR CONCRETE
- 5' MIN. CONCRETE SIDEWALK
- LANDSCAPE AREA
- LEASEHOLD BOUNDARY LINE
- NEW LIGHT POLE
- NEW BOLLARD LIGHT
- NEW BLUE EMERGENCY LIGHT POLE WITH CALL BOX
- NEW CARD-READER
- NEW SIGN
- NEW SECURITY CAMERA
- 8'-0" WROUGHT IRON SECURITY FENCE
- CMU WALL
- CAST-IN-PLACE CONCRETE WALL
- ACCESSIBLE PATH OF TRAVEL
- EXISTING FIRE HYDRANT TO REMAIN
- NEW CONCRETE ACCENT WALL

SITE PLAN KEYNOTES

1. NEW 8'-0" HIGH SECURITY FENCE - NON-CLIMBABLE WROUGHT IRON PICKET FENCING - FENCING TO BE INSTALLED SO THAT BOTTOM OF PICKETS ARE WITHIN 2" OF THE GROUND
2. NEW SELF-CLOSING 24'-0" WIDE X 8'-0" HIGH MOTORIZED WROUGHT IRON SWINGING GATES LEADING TO AOA. GATE IS MONITORED BY SECURITY CAMERA FEED TO RECEPTIONIST DESK - PROVIDE KEY SWITCH, PRE-EMPTION SENSOR AND SIMPLE ELECTRONIC ACCESS CONTROL DEVICE (CARD READER) - SEE DOOR AND GATE NOTES FOR ADDITIONAL REQUIREMENTS - SEE DETAIL 31/SP2.3 AND ELECTRICAL DRAWINGS
3. SELF-CLOSING ARM BAR BARRIER LINKED TO ROLLING GATE ACCESS CONTROL DEVICE (CARD READER) AND OBSTRUCTION SENSOR - SEE ELECTRICAL DRAWINGS
4. MOTORIZED ROLL-UP DOOR
5. SELF-CLOSING MAN GATE TO AIR OPERATIONS AREA (AOA) - SEE DOOR AND GATE NOTES ON SHEET SP1.3 FOR ADDITIONAL REQUIREMENTS
6. EXIT STAIR FROM PARKING GARAGE
7. CARD-READER LOCATION
8. BLUE LIGHT EMERGENCY CALL BOX - SEE ELECTRICAL DRAWINGS
9. SECURITY CAMERA LOCATION - PROVIDE CONDUIT FOR VIDEO FEED TO RECEPTION DESK AND MANAGER OFFICE
10. PRIMARY, ACCESSIBLE, LANDSIDE BUILDING ENTRY FOR PUBLIC USE - NO CARD-READER. PROVIDE SIGNAGE WITH THE INTERNATIONAL SYMBOL OF ACCESSIBILITY - SEE DETAIL 28/SP2.2
11. ~~CONCRETE TERRAZZO PAVING~~
12. EXISTING SECURITY GATE AT ADJACENT PROPERTY TO REMAIN - NEW FENCING TO ABUT EXISTING FENCING AND GATES THAT LINE OF SECURITY IS MAINTAINED. ANY GAPS SHALL NOT EXCEED 4"
13. POSTED SIGN THAT PROVIDES WARNING OF THE PROHIBITION AGAINST UNAUTHORIZED ENTRY - SEE DETAIL 36/SP2.3
14. 6' HIGH CMU GATED REFUSE ENCLOSURE PER CITY OF SCOTTSDALE STANDARDS - SEE DETAILS 26.421/SP2.2, AND 29/SP2.3
15. MAN DOOR IN HANGAR DOOR - CARD READER ACCESS
16. OBSTRUCTION FREE ENTRY AND SHADOW LOOPS - VEHICLE DETECTION
17. SECURITY CAMERA AND CAMERA FOR LICENSE PLATE PHOTOGRAPHY - PROVIDE CONDUIT FOR VIDEO FEED TO RECEPTION DESK AND MANAGER OFFICE
18. LINE OFFICE ENTRY - CARD-READER ACCESS
19. NEW CONCRETE SIDEWALK PAVING, 5' MIN. WIDE WALKWAYS, TYP.
20. NEW LANDSCAPE AREA - SEE LANDSCAPE DRAWINGS
21. ~~NEW PUBLIC ART INSTALLATION - SEE ENLARGED PLANS AND ELEVATIONS~~ SHEET SP2.4
22. ~~NEW EXTERIOR PORCELAIN TILE PAVERS - SEE LANDSCAPE DRAWINGS~~
23. NEW DRIVEWAY PER CITY OF SCOTTSDALE STANDARDS - SEE CIVIL DRAWINGS AND DETAIL 21/SP2.2
24. ACCESSIBLE PATH OF TRAVEL FROM PUBLIC WAY TO BUILDING ENTRY - ACCESSIBLE ROUTE OF TRAVEL TO BE 3' WIDE MIN. WITH MAX. SLOPE OF 1:20, AND MAX. CROSS SLOPE OF 1:50
25. VAN ACCESSIBLE PARKING SPACE AND SIGNAGE - SEE DETAILS 25/SP2.2 & 22/SP2.2. ACCESSIBLE PARKING SPACES SHALL HAVE A SLOPE NOT EXCEEDING 1:50
26. ACCESSIBLE PARKING SPACE AND SIGNAGE - SEE DETAILS 25/SP2.2 & 22/SP2.2. ACCESSIBLE PARKING SPACES SHALL HAVE A SLOPE NOT EXCEEDING 1:50.
27. NEW ACCESSIBLE CURB RAMP
28. 6" CONCRETE CURB - SEE DETAIL 3/SP2.0
29. PAINTED CROSS WALK STRIPING - SEE DETAIL 7/SP2.0
30. NEW SES AND PANELS SERVING EXISTING HANGAR
31. EXISTING LIGHT POLE TO REMAIN - VERIFY EXACT LOCATION AND NOTIFY ARCHITECT OF ANY CONFLICT WITH DEMOLITION OR CONSTRUCTION
32. EXISTING FIRE HYDRANT TO REMAIN
33. CAST-IN-PLACE CONCRETE RAMP DOWN TO GARAGE
34. ~~WALL MOUNTED SIGN BY DEFERRED APPROVAL G.C. TO PROVIDE CONDUIT~~ FOR POWER TO SIGN
35. GROUND-MOUNTED MONUMENT SIGN BY DEFERRED APPROVAL - G.C. TO PROVIDE CONDUIT FOR POWER TO SIGN
36. 3'-0" HIGH CMU PARKING SCREEN WALL WITH STUCCO FINISH TO MATCH BUILDING - SEE DETAIL X/X
37. NEW CONCRETE CURB AND GUTTER PER CITY OF SCOTTSDALE STANDARDS - SEE CIVIL DRAWINGS
38. 3'-0" WIDE 8'-0" HIGH SELF-CLOSING MAN GATE - SEE DETAIL 32/SP2.3
39. BICYCLE RACK - PER CITY OF SCOTTSDALE STANDARDS - SEE DETAIL 36/SP2.7. EACH RACK HOLDS 2 BIKES FOR A TOTAL OF 10 BIKE SPACES
40. NEW BOLLARD LIGHT - SEE SITE LIGHTING PLAN, SP1.1 AND ELECTRICAL DRAWINGS
41. ONE-WAY, EXIT ONLY DRIVEWAY FOR AIRPLANE TUG
42. 8'-0" HIGH CMU WALL
43. NEW TRANSFORMER SERVING EXISTING HANGAR
44. NEW TRANSFORMER SERVING NEW BUILDING
45. NEW DESERT LANDSCAPE FEATURE
46. POSSIBLE RETENTION AREA
47. EXISTING FENCE TO REMAIN
48. NEW CONCRETE ACCENT WALL
49. 90 GALLON CITY OF SCOTTSDALE RECYCLING CONTAINER PER IGCC 901.3.4.1
50. ROOF MOUNTED ONSITE RENEWABLE ENERGY SYSTEM (SOLOR PV) - NOT LESS THEN 3% OF ANNUAL ESTIMATED ENERGY OR 2 WATTS PER SQ. FT. MULTIPLIED BY THE GROSS ROOF AREA IN ACCORDANCE WITH IGcc AMENDED SECTION 1013

APPROVED PER ARTICLE 7 OF
LEASE AGREEMENT 2010-166-COS

DATE: _____ INITIALS: _____

CITY OF SCOTTSDALE APPROVAL BLOCK

GRAPHIC SCALE 1"=20'-0"
10' 40'
0 20'

TRUE NORTH

KEYNOTE SITE PLAN

SCALE: 1"=20'-0"

x-site-ONESKY

Larson Associates Architects, Inc.
3807 North 24th Street, Suite 100
Phoenix, AZ 85016
602.955.9929 602.954.4790 FAX
design@larson-architects.com

Larson

FLEXJET PAX TERMINAL/OFFICE/HANGAR
SCOTTSDALE
15115 N. AIRPORT DR.
SCOTTSDALE, AZ 85260

REGISTERED ARCHITECT
CERTIFICATE NO.
9252
JAMES LAWRENCE LARSON
Date Signed
ARIZONA, USA

EXPIRES: 6/30/2024

Drawing Name:
NEW KEYNOTE SITE PLAN

Revisions
1-12-24 PRE-APP

Date: 1/12/24

Project Number:
2021.004

Drawing No:
SP1.1

TABLE B105.1(1)
REQUIRED FIRE FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE FLOW (gallons per minute)	FLOW DURATION (hours)
0–3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0–3,600	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	500	$^{/}_{2}$
3,601 and greater	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	$^{1}/_{2}$ value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m.

TA LE B105.1(2)
REFERENCE T LE FOR TABLES B10 .1(1) AND 05.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V- [a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-5 ,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

Flow Test Summary

Project Name:	EJFT 21268 - Simcom at Scottsdale Airport
Project Address:	N Airport Dr & E 75th St, Scottsdale, AZ 85260
Date of Flow Test:	2021-07-13
Time of Flow Test:	8:10 AM
Data Reliable Until:	2022-01-13
Conducted By:	Eder Cueva & Simon Lotero (EJ Flow Tests) 602.999.7637
Witnessed By:	Aaron Roby (480.407.7022) City of Scottsdale
City Forces Contacted:	City of Scottsdale (480.407.7022)
Permit Number:	C65803

Note Scottsdale requires a max static pressure of 72 psi for safety factor.

Raw Flow Test Data

Static Pressure:	92.0 PSI
Residual Pressure:	80.0 PSI
Flowing GPM:	2,693
GPM @ 20 PSI:	7,086

Data with a 20 PSI Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	60.0 PSI
Flowing GPM:	2,693
GPM @ 20 PSI:	5,944

Hydrant F_1

Pitot Pressure (1):	57	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	4	inches

Additional Coefficient 0.83 on orifice #1

Project Site

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
543 ft (measured linearly)

Static-Residual Elevation
1467 ft (above sea level)

Flow Hydrant (F_1) Elevation
1464 ft (above sea level)

Elevation & distance values are approximate

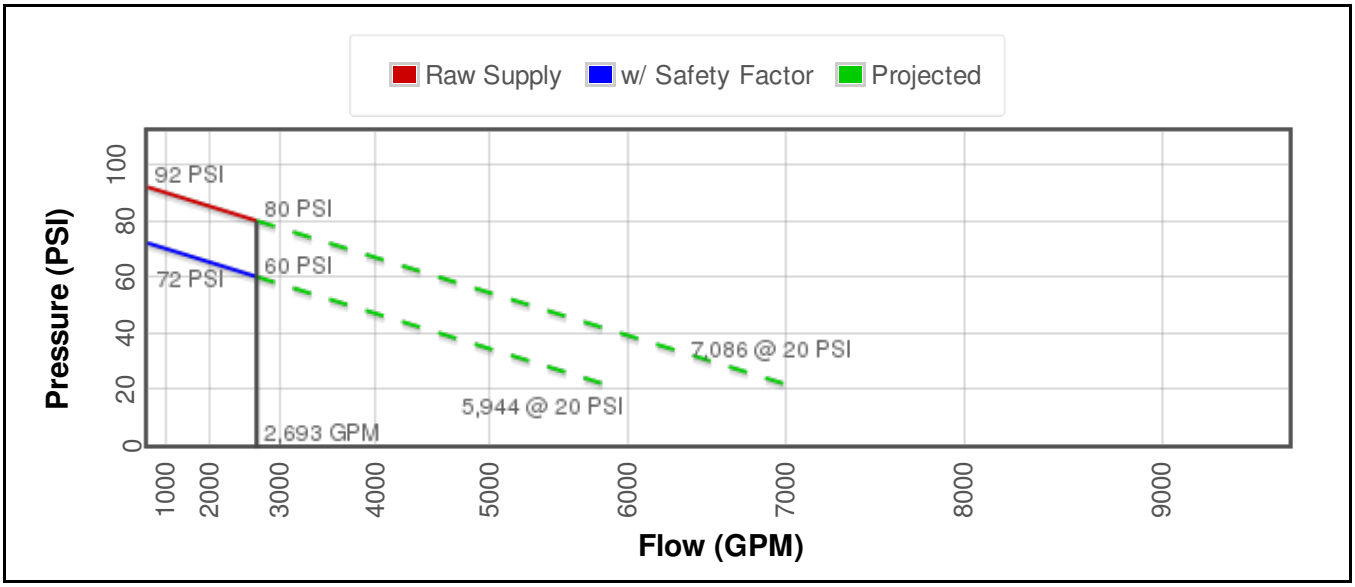
Flow Test Summary

Static-Residual Hydrant

Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph



AVERAGE DAY WATER DEMANDS				
Land Use	**Inside Use**	**Outside Use**	**Total Use**	
Residential Demand per dwelling unit:				
< 2 DU/ac	208.9	276.7	485.6	per unit
2 – 2.9 DU/ac	193.7	276.7	470.4	per unit
3 – 7.9 DU/ac	175.9	72.3	248.2	per unit
8 – 11.9 DU/ac	155.3	72.3	227.6	per unit
12 – 22 DU/ac	155.3	72.3	227.6	per unit
High Density Condominium	155.3	30	185.3	per unit
Resort Hotel	401.7	44.6	446.3	per unit
Service and Employment:				
Commercial/Retail	0.7	0.1	0.8	per sq.ft.
Commercial High Rise	0.5	0.1	0.6	per sq.ft.
Office	0.5	0.1	0.6	per sq.ft.
Institutional	670	670	1340	per acre
Industrial	873	154	1027	per acre
Research and Development	1092	192	1284	per acre
Special Use Areas:				
Natural Area Open Space	0	0	0	per acre
Developed Open Space – Parks	0	1786	1786	per acre
Developed Open Space – Golf Course	0	4285	4285	per acre

FIGURE 6-2. AVERAGE DAY WATER DEMANDS IN GALLONS PER DAY

3. Use H2ONET, WATERCAD, or EPANET software for any computer modeling of water flows and pressures. Other software products may be authorized by the Water Resources Department.
4. Analyze the water system for average day, maximum day, peak hour, and maximum day with fire demand.
5. Show in calculations that the minimum water pressure requirements are met at the highest proposed finish floor elevation (with and without fire flow).
6. Indicate in water pipeline calculations the head losses per 1000 feet, pipe capacity, pipe velocity, and pipe size.
7. Include diagrams clearly showing all water pipe and node references.
8. Pay particular attention to water demand factors used for restaurants or specialty developments.
9. Use scour analysis where surface flows exceed 500 cfs.

F. Design Documentation

1. Submit electronic copies of all computer calculations for the water analysis along with the final report.
2. Ensure all common spreadsheet formats are compatible with MS Excel.

G. Summary

1. Provide a summary of the proposed water improvements stating that all the city's design standards and policies have been met or indicate any variance or exception. Note why the developer is requesting any variance or exception.
2. Include a brief project schedule indicating the proposed start and completion of the developments improvements.

EAST
GREENWAY
ROAD
INDUSTRIAL
AIRPARK
SUITES
UNIT 4
NO. 03A
STREET
E. KAREN DR.
75TH
AVIATION WY.
N.
SCOTTSDALE
(221-19)
RAINTREE
(855-27)
MUNICIPAL
AIRPORT
Arsenic Treatment Facility
Waiting for Water Line Info
WATER SITE S-7
NOTICE 01/134032
W.D. 6126/203-205
AGR. 01/599995
LEASE AGREEMENT 01/107550

EAST
GREENWAY
ROAD
INDUSTRIAL
AIRPARK
SCOTTSDALE
RAINTREE
NO. 03A
75TH STREET
NORTH
AVIATION WY.
E KAREN DR
AIRPORT
MUNICIPAL
8" VCP
8" PVC
2" PVC
12" VCP
M.H. TAP
1475.11 3+44
1475.46 1462.91 N 1462.91 E 1462.91 W
1475.54 3+32
1475.97 1463.62 N 1463.62 E 1463.62 W
1476.85 1463.75 N 1463.65 E 1463.65 W
1477.57 3+31
1478.36 0+29
1477.84 3+19
1477.91 1+26
1478.30 1+47
1478.11 2+15
1479.52 5+00
1479.28 1471.48 N 1471.48 W
1474.68 1461.03 N 1461.03 E 1461.03 W
1472.83 1463.22 W 1463.22 E
1470.52 1464.03 W 1464.03 E 1464.03 S
1472.92 2+71
1473.97 2+98
1474.10 3+72
1472.25 1465.50 E 1465.50 W
1474.44 1+76
1472.42 1466.20 E 1466.20 W
1473.16 1466.91 E 1466.91 W
1476.07 1468.31 E 1468.31 W
1478.91 3+79
1476.20 1469.81 W
1477.62 3+40
1472.32 1465.12 W 1465.12 E
1471.00 1460.76 N 1460.76 SW
1472.33 4+10
1469.74 3+56
1467.68 1458.73 NW 1458.73 NE 1458.73 SW
1469.90 0+71
1468.39 0+49
1468.09 2+84
1466.30 1459.92 SW
1464.69 1456.95 NE 1456.95 SW
1464.30 1458.59 NE 1458.59 SW
1466.21 3+54
1461.56 1451.46 SE 1451.46 NW
1464.14 2+66
1464.54 1+07
1461.14 1457.49 NE 1457.49 SW
1462.65 0+55
1463.64 1456.43 SE 1456.33 W
1462.32 3+03
1463.24 1455.21 E 1455.08 NE 1454.79 SW 1454.70 NW
1463.06 0+34
1463.95 1456.67 SE 1456.57 NW
1462.36 1457.23 NW
1463.34 1+98
1462.96 1+18
1461.81 1456.38 SE
N.F. N.F.
1+01
1+94
1+68
1+65
2+11
0+80
1+30
1+78
1+15
0+87
2+64
0+93
2+61
0+39
1+53
3+14
1+13
1+20
0+03
2+13
3+51
4+02
3+49
1+68
1+40
0+71
2+54
1+07
1+30
1+98
1+18
1+15
(7652)
(7678)
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(15011)
(15001)
(15000)
(15003)
(15101)
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(15041)
(15115)
(15351)
(14800)
(14960)
(14970)
(14980)
5231/219
11886/540-541
12597/1264-1265
01/134032
96/544341
97/058571 & 97/100221
96/853743
96/628129
97/019718
15350/63
15957/418
12163/1346
14495/134
84/107968
84/428096
84/453910
84/223532
84/480121
85/532505
96/615495
94/529825
94/529821
05/074314
02/036193
01/1075011
08/0005102
01/111744
80/0071168
86/286709
86/678074
99/027193
98/1167115
98/1167116
98/1167114
97/1167177/916
16/0185196
16/0185175
16/0185131
16/0185135
87/022034
6126/203-205
01/599995
96/640708
83/003665
01/134032

DESIGN FLOWS

7-1.403

A. Residential

Sanitary sewer lines 8 to 12 inches in diameter will be designed using 100 gallons per capita per day (gpcpd) and a peaking factor of 4.

Sanitary sewer lines larger than 12 inches in diameter will be designed using 105 gpcpd and a peaking factor developed from "Harmon's Formula":

$$Q_{max} = Q_{avg} [1+14 / (4+P1/2)]$$

$$P = Population / 1,000$$

Residential densities are to assume 2.5 persons per dwelling unit, apartment or town home.

B. Commercial and Industrial

Wastewater flows for uses other than those listed below shall be based upon known regional or accepted engineering reference sources approved by the Water Resources Department.

AVERAGE DAY SEWER DEMANDS		
Land Use	**Demand**	**Peaking Factor**
Commercial/Retail	0.5 per sq. ft.	3
Office	0.4 per sq. ft.	3
Restaurant	1.2 per sq. ft.	6
High Density Condominium	140 per room	4.5
Resort Hotel (includes site amenities)	380 per room	4.5
School: without cafeteria	30 per student	6
School: with cafeteria	50 per student	6
Cultural	0.1 per sq. ft.	3

FIGURE 7.1-2 AVERAGE DAY SEWER DEMAND IN GALLONS

HYDRAULIC DESIGN

7-1.404

No public sanitary sewer lines will be less than 8 inches in diameter unless permission is received in writing from the Water Resources Department.

Sanitary sewer lines should be designed and constructed to give mean full flow velocities of not less than 2.5 fps, based upon Manning's Formula, using an "*n*" value of 0.013.

Conversely, to prevent abrasion and erosion of the pipe material, the maximum velocity will be limited to 10 fps at estimated peak flow. Where velocities exceed this maximum figure, the line should be constructed of DIP and lined. In no case will velocities greater than 15 fps be allowed.

Actual velocities will be analyzed under peak flow conditions for each reach of pipe.

Generally, the sanitary sewer system will be designed to achieve uniform flow velocities through consistent slopes. Abrupt changes in slope should be evaluated for hydraulic jump.

The depth to diameter (d/D) ratio for gravity sanitary sewer pipes 12 inches in diameter and less should be no greater than 0.65 in the ultimate peak flow condition. The d/D ratio for gravity drains greater than 12 inches diameter should be no greater than 0.70 for the ultimate peak flow condition.

Mitigation of hydrogen sulfide will be analyzed in the design report and be provided for in the design of the system.